

- 1 1. A process to remove N-contaminants from a syngas stream comprising the steps of:
  - 2 (a) introducing a syngas stream and a water stream into a first absorber;
  - 3 (b) recovering a first-washed syngas stream overhead from the first absorber;
  - 4 (c) introducing the first-washed syngas stream and a Fischer-Tropsch produced water  
5 stream into a second absorber; and
  - 6 (d) recovering a second-washed syngas stream overhead from the second absorber.
- 1 2. The process of claim 1 further comprising the step of:
  - 2 (e) using the second-washed syngas stream as a feed for a first stage Fischer-Tropsch  
3 reactor.
- 1 3. The process of claim 2 wherein the first stage Fischer-Tropsch reactor contains a catalyst  
2 comprising cobalt.
- 1 4. The process of claim 1 wherein the syngas is generated in a the presence of air or oxygen-  
2 enriched air.
- 1 5. A Fischer-Tropsch process comprising the steps of:
  - 2 (a) introducing a feed syngas stream into a first-stage Fischer-Tropsch reactor and  
3 recovering a first overhead stream comprised of Fischer-Tropsch produced water, hydrocarbon  
4 product and unreacted syngas from the first stage Fischer-Tropsch reactor;
  - 5 (b) separating the unreacted syngas component from the first overhead stream and  
6 introducing the unreacted syngas component into a second stage Fischer-Tropsch reactor;
  - 7 (c) recovering a second overhead stream comprised of Fischer-Tropsch produced water  
8 and hydrocarbon product from the second stage Fischer-Tropsch reactor;
  - 9 (d) separating the Fischer-Tropsch produced water from the second overhead stream;  
10 and
  - 11 (e) mixing the Fischer-Tropsch produced water separated in step (d) with the first  
12 overhead stream.
- 1 6. The process of claim 5 wherein the mixing step (e) occurs prior to the separation step (b).
- 1 7. The process of claim 5 wherein the mixing step (e) occurs simultaneously with the  
2 separation step (b).
- 1 8. The process of claim 5 further comprising the steps of:
  - 2 (i) separating the Fischer-Tropsch produced water from the first overhead stream;

3 (ii) feeding the Fischer-Tropsch produced water separated in step (i) and a raw syngas  
4 stream into a first absorber; and

5 (iii) recovering a washed syngas stream from the first absorber.

1 9. The process of claim 8 wherein the washed syngas stream from the first absorber is used as  
2 the feed syngas stream in step (a).

1 10. The process of claim 5 wherein the first and second stage Fischer-Tropsch reactors contain  
2 a catalyst comprising cobalt.

1 11. The process of claim 5 wherein the syngas stream is produced in the presence of air or  
2 oxygen-enriched air.

1 12. In a Fischer-Tropsch process wherein a synthesis gas is catalytically converted into a  
2 Fischer-Tropsch reaction product mixture and wherein two or more Fischer-Tropsch reactors  
3 are used in the process, the process improvement comprising:

4 (a) separating Fischer-Tropsch produced water from the Fischer-Tropsch reaction product  
5 mixture of a first Fischer-Tropsch reactor; and

6 (b) mixing the separated Fischer-Tropsch water from step (a) with the feed to a second  
7 Fischer-Tropsch reactor wherein the second Fischer-Tropsch reactor is the same as the first  
8 Fischer-Tropsch reactor or is located upstream of the first Fischer-Tropsch reactor.

1 13. The process improvement of claim 12 wherein the synthesis gas is produced in the  
2 presence of air or oxygen-enriched air.

1 14. The process improvement of claim 12 wherein the Fischer-Tropsch reactors contain a  
2 catalyst comprising cobalt.

1 15. The process of claim 1 further comprising the steps of:

2 (f) recovering a first nitrogen-enriches aqueous stream from the first absorber; and

3 (g) recovering a second nitrogen-enriches aqueous stream from the second absorber.

1 16. The process of claim 16 further comprising the step of mixing the first and second  
2 nitrogen-enriched streams together.

1 17. The process of claim 15 further comprising the step of treating at least one of the first and  
2 second nitrogen-enriched streams by removing all or part of the nitrogen contaminants in such  
3 stream(s).

1 18. The process of claim 17 further comprising the step of recycling the treated aqueous  
2 stream(s).

- 1 19. The process of claim 1 wherein the temperature of at least one of the water stream
- 2 introduced into the first absorber and the Fischer-Tropsch produced water stream introduced
- 3 into the second absorber are temperature controlled.